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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/991,953
Filing Date: November 26, 2001
Appellant(s): KUNII, TOSIYASU L.

Ralph A. Dowell
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed November 19, 2007 appealing from the Office action mailed April 19, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6-14, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bowman et al. (US 6,169,986) in view of Ng.

Bowman et al. shows all of the limitations of the claims except for specifying the use of the search system with a group of stores in an e-mall.

Bowman et al. shows, figure 1, a system and method for refining search queries. In accordance with the invention, the related terms are generating using query term correlation data that is based on historical query submissions to the search engine. The query term correlation data ("correlation data") is preferably based at least upon the frequencies with which specific terms have historically been submitted together within the same query. In accordance with one aspect of the invention, the correlation data is stored in a correlation data structure (table, database, etc.), which is used to look up related terms in response to query submissions. The data structure is preferably generated using an off-line process, which parses a query log file, but could alternatively be generated and updated in real-time as queries are received from users. Thus, for example, in the context of a search engine of an online merchant (e-shop), the search engine tends to suggest related terms that correspond to the current best-selling products. Notice the Amazon.com book example. The attributes or key words can be author, subject or style.

In a preferred embodiment, each entry in the data structure is in the form of a key term (attribute) and a corresponding related terms list. Each related terms list contains

the terms, which have historically appeared together (in the same query) with the respective key term with the highest degree of frequency. The data structure thus provides an efficient mechanism for looking up the related terms for a given query term.

To generate a set of related terms for refining a submitted query (the "present query" or first customer query), the related terms list for each term in the present query is initially obtained from the correlation data structure. The related terms, which remain are terms, which have previously appeared, in at least one successful query submission, in combination with every term of the present query. Thus, assuming items have not been deleted from the database being searched, any of these related terms can be individually added to the present query while guaranteeing that the modified query will not produce a NULL query result. To take advantage of this feature, the related terms are preferably presented to the user via a user interface that requires the user to add no more than one related term per query submission.

One aspect of the invention is thus a method of assisting users in refining search queries. The method is performed by a computer system that implements a search engine that is accessible to a community of users. The method comprises receiving a search query submitted by a user (subsequent search attributes), wherein the search query comprises at least one term. The method further comprises using a history of search queries (adding attributes to correspondence table) submitted to the search engine over a selected period of time by the community of users to identify at least one refinement to the search query, and suggesting the at least one refinement to the user.

Another aspect of the invention is a system for assisting users in refining search queries submitted to a search engine. The system comprises a first program module, which processes query logs of the search engine to generate correlation data that reflects frequencies of occurrences of query terms (recording new correspondence relationships) within the same query. The system further comprises a second program module, which uses at least the correlation data to suggest refinements to search queries received from users.

The invention further includes a method of facilitating the refinement of search queries. The method comprises receiving a search query submitted by a user, and identifying a plurality of refined search queries, each of which comprises all terms of the query submitted by the user and an additional term.

Column 11, lines 35-44 show the detection of a purchase of a suggested product.

Ng teaches, figure 1, a system of e-shops sharing resources in an e-mall in order to increase revenue. Bottom of column 1 teaches a product search for a group of stores in an e-mall.

Based on the teaching of Ng, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify Bowman et al. search system such that it is use for a product search for a group of stores in an e-mall in order to increase revenue.

Claims 15-17, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bowman et al. (US 6,169,986) and Ng I further view of Bauer et al.

The combination system of Bowman et al. and Ng, as discussed above, shows all of the limitations of the claims except for specifying detecting contradicting data, defining false correspondence, and deleting the false correspondence.

Bauer et al. teaches a database synchronizer, which determines conflict detection (column 25, lines 12-13) and runs programs (column 25, lines 39-54), which include defining "false" data and deleting it in order to properly combine two sets of data.

Based on the teaching of Bauer et al., it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the combination system of Bowman et al. and Ng to incorporate the synchronization method of Bauer including conflict detection and defining "false" data and deleting it in order to properly combine two sets of data.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,169,986	BOWMAN ET AL.	1-2001
6,405,175	NG	6-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 6-14, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bowman et al. (US 6,169,986) in view of Ng.

Claims 15-17, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bowman et al. (US 6,169,986) and Ng I further view of Bauer et al.

(10) Response to Argument

Preliminary Note: The Examiner has adopted Appellant's outline format for use in addressing Appellants' arguments.

I. Rejection under 35 U.S.C. § 103(a) over Bowman et al. in view of Ng

A. Claims 23 and 24

Appellant remarks that "Bowman and Ng, whether taken alone or in combination do not teach or suggest at least the elements of: determining if any attributes of the first search attributes did not previously exist in the attribute correspondence table, and for each such attribute: defining such attribute as a new attribute, and recording at least one new correspondence relationship between the new attribute and a product attribute that is associated with the first product in the attribute correspondence table", as recited in claim 23. (Arguments section, pages 15-16, fifth paragraph or last paragraph)

Examiner does not agree. The combination of Bowman and Ng teaches or suggest the recitation above, specifically, Bowman teaches the above recitation. Bowman discloses a query term correlation data which is regenerated periodically from recent query submission such as by using the last M days of entries in a query (col. 4, lines 53-57). The query term correlation data is generated from the query log using the table generation process. The table generation process is a process which runs once a day and generates a new query correlation table. (Col. 8, lines 19-24) The building of the query correlation table consists of two primary phases generating daily log files and periodically parsing and processing these logs files to generate the query correlation table (Col. 8, lines 40-44). Each time query term correlation data is generated for a new constituent time period, the generation process preferably combines this new data with existing data from earlier constituent time periods to form a collective query correlation table with information covering a longer composite period of time (col. 8, lines 51-56).

Bowman further discloses a web server which maintains a log file detailing all of the requests it has received from web browsers. The log file is made up of several entries, each containing information about a different request. (Col. 9, lines 2-6) Each time a user performs a search, the web server stores information about the submitted query in a log entry of a query log. The web server generates daily query log files which each contain the log entries for a respective day. (Col. 9, lines 7-13) The first log entry contains date and time information for when the user submitted the query, query terms entered by the user and the number of the items found for the query. (Col. 9, lines 13-19) The generation process parses the daily query log file to identify and extract

queries. Ignoring the query submission that produced a NULL query result provides the important benefits of preventing non-matching terms from being added to the correlation table either as keywords or as related terms and excluding potentially weak correlations between matching terms from consideration. Excluding such "unsuccessful" query submissions enables the query terms selection process to be implemented so as to guarantee that the modified query will produce a successful query results. (Col. 9, line 64 –col. 10, line 12). Examiner notes that all non-matching terms are added to the correlation table either as keywords or as related terms which Examiner is interpreting as new attributes. Therefore, all query terms that the user searches for which include new terms are added to the correlation table because the user is always guaranteed a successful query result.

Moreover, Bowman discloses a table generation process which parses a query "OUTDOOR BIKE TRAIL" that is submitted in the subject field. In response to the query, the generation process updates the mapping producing the mapping shown in Figure 5B. The generation process looks up the first key term "S-OUTDOOR" and then looks for the related term "S-BIKE" and "S-TRAIL". If the related term is found, its value is incremented. If the related term is not found, the generation process adds the related term and assigns it a beginning value (new correspondence relation). (Col. 11, lines 6-16)

Such parsing the daily log file to identify and extracting queries; ignoring the query submission that produced a NULL query result, thus providing the important benefits of preventing non-matching terms from being added to the correlation table

either as keywords or as related terms and excluding potentially weak correlations between matching terms from consideration; the excluding of such "unsuccessful" query submissions enables the query terms selection process to be implemented so as to guarantee that the modified query will produce a successful query results; and if the related term is not found , the generation process adds the related term and assigns it a beginning value are considered "determining if any attributes of the first search attributes did not previously exist in the attribute correspondence table, and for each such attribute: defining such attribute as a new attribute, and recording at least one new correspondence relationship between the new attribute and a product attribute that is associated with the first product in the attribute correspondence table".

Appellant remarks "for similar reasons as those described above with claim 23, as well as for the additional elements included therein, claim 24 is also believed to be in condition for allowance". (Arguments section, page 21, first paragraph)

Examiner directs Appellants attention to the discussion above pertaining to claim 23.

B. Claims 6, 7, 8, 9, 10, 11, 12, 13 and 14

Appellant remarks that "Bowman et al. and Ng, whether taken alone or in combination, do not teach or suggest at least the elements of: specifying a correspondence relation between search information input by the customer at the time of a search and information about merchandise selected by the customer in concluding the electronic commercial transaction...; inspecting a history of prior electronic

commercial transactions to determine whether the specified correspondence relation is a new correspondence relation...; and where the specified correspondence relation is a new correspondence relation, the search information defining the new correspondence relation is corresponded to information on the merchandise selected in concluding the electronic commercial transaction as a new attribute...", as recited in claim 6. (Arguments section, page 21, fifth paragraph or last paragraph)

Examiner does not agree. The combination of Bowman and Ng teaches or suggest the recitation above, specifically, Bowman teaches the above recitation. Bowman discloses a search refinement method for generating and displaying related query terms. The related terms are generated using query term correlation data that is based on historical query submission to the search engine. (Col. 2, lines 30-34) Bowman discloses a search engine that is used to assist customers of Amazon.com Inc. in locating items from an on-line catalog of products (col. 5, lines 9-12). The Amazon.com web site includes functionality for allowing users to search, browse and make purchases from an online catalog of products via the Internet. Because the catalog contains million of items it is important that the site provide an efficient mechanism for assisting user in locating items. (Col. 5, lines 23-29) The web site includes a web server application which processes user request received from user computers. These requests include queries submitted by users to search on-line catalog for products. (Col. 5, lines 30-34) A query server which processes the queries by searching a bibliographic database which includes information about various products that users may purchase through the web site (Col. 5, lines 40-44) The query

server includes related term selection process which identifies related query terms based on query term correlation data stored in a correlation table (col. 5, lines 55-57). The query term correlation data is regenerated periodically from recent query submission such as by using the last M days of entries in a query (col. 4, lines 53-57). The query term correlation data is generated from the query log using the table generation process. The table generation process is a process which runs once a day and generates a new query correlation table. (Col. 8, lines 19-24) The building of the query correlation table consists of two primary phases generating daily log files and periodically parsing and processing these logs files to generate the query correlation table (Col. 8, lines 40-44). Each time query term correlation data is generated for a new constituent time period, the generation process preferably combines this new data with existing data from earlier constituent time periods to form a collective query correlation table with information covering a longer composite period of time (col. 8, lines 51-56).

The web server which maintains a log file detailing all of the requests it has received from web browsers. The log file is made up of several entries, each containing information about a different request. (Col. 9, lines 2-6) Each time a user performs a search, the web server stores information about the submitted query in a log entry of a query log. The web server generates daily query log files which each contain the log entries for a respective day. (Col. 9, lines 7-13) The first log entry contains date and time information for when the user submitted the query, query terms entered by the user and the number of the items found for the query. (Col. 9, lines 13-19) The generation process parses the daily query log file to identify and extract queries. Ignoring the query

submission that produced a NULL query result provides the important benefits of preventing non-matching terms from being added to the correlation table either as keywords or as related terms and excluding potentially weak correlations between matching terms from consideration. Excluding such "unsuccessful" query submissions enables the query terms selection process to be implemented so as to guarantee that the modified query will produce a successful query results. (Col. 9, line 64 –col. 10, line 12). Examiner notes that all non-matching terms are added to the correlation table either as keywords or as related terms which Examiner is interpreting as new attributes. Therefore, all query terms that the user searches for which include new terms are added to the correlation table because the user is always guaranteed a successful query result.

Moreover, Bowman discloses a table generation process which parses a query "OUTDOOR BIKE TRAIL" that is submitted in the subject field. In response to the query, the generation process updates the mapping producing the mapping shown in Figure 5B. The generation process looks up the first key term "S-OUTDOOR" and then looks for the related term "S-BIKE" and "S-TRAIL". If the related term is found, its value is incremented. If the related term is not found, the generation process adds the related term and assigns it a beginning value (new correspondence relation). (Col. 11, lines 6-16) Bowman also discloses the amount by which the correlation scores are incremented may be increased or decreased depending on different kinds of selection actions performed by the users on items identified in query results. These include whether the user displayed additional information about an item, whether the user

added the item to his or her shopping basket, and whether the user ultimately purchased the item. (Col. 11, lines 35-44)

Such search engine that is used to assist customers of Amazon.com Inc. in locating items from an on-line catalog of products; Amazon.com web site which includes functionality for allowing users to search, browse and make purchases from an online catalog of products via the Internet; the web site which includes a web server application which processes user request received from user computers; the requests which include queries submitted by users to search on-line catalog for products; the query server which processes the queries by searching a bibliographic database which includes information about various products that users may purchase through the web site; the query server which includes related term selection process which identifies related query terms based on query term correlation data stored in a correlation table; related terms which are generated using query term correlation data that is based on historical query submission to the search engine; parsing the daily log file to identify and extracting queries; ignoring the query submission that produced a NULL query result, thus provides the important benefits of preventing non-matching terms from being added to the correlation table either as keywords or as related terms and excluding potentially weak correlations between matching terms from consideration; the excluding of such “unsuccessful” query submissions enables the query terms selection process to be implemented so as to guarantee that the modified query will produce a successful query results; if the related term is not found, the generation process adds the related term and assigns it a beginning value; amount by which the correlation scores are

incremented may be increased or decreased depending on different kinds of selection actions performed by the users on items identified in query results that include whether the user added the item to his or her shopping basket, and whether the user ultimately purchased the item. are considered "specifying a correspondence relation between search information input by the customer at the time of a search and information about merchandise selected by the customer in concluding the electronic commercial transaction...; inspecting a history of prior electronic commercial transactions to determine whether the specified correspondence relation is a new correspondence relation...; and where the specified correspondence relation is a new correspondence relation, the search information defining the new correspondence relation is corresponded to information on the merchandise selected in concluding the electronic commercial transaction as a new attribute...".

Appellant remarks that "Bowman and Ng, whether taken alone or in combination, do not teach or suggest at least the additional elements of: a correspondence generating unit configured to specify correspondence relations between attributes.., based on an equivalence relation which satisfies a reflexive law, a symmetric law and a transitive law...[and] configured to extract, by a cellular decomposition operation, one or more of the specified correspondence relations...by decomposing a set of attributes into nonempty disjoint equivalence classes according to the equivalence relation", as recited to claim 6. (Arguments section, page 22, second paragraph)

Examiner does not agree. The combination of Bowman and Ng teaches or suggest the recitation above, specifically, Bowman teaches the above recitation.

Bowman discloses a search refinement system using a history of queries submitted to a search engine by a community of users. The system generates query term correlation data which reflects the frequency with which specific terms have previously occurred together within the same query. The system uses the query term correlation data in combination with the query term(s) entered by the user to recommend additional query terms for refining the query. The incorporation of such historical query information into the process tends to produce related terms that are frequently used by other users in combination with the submitted query terms. (Col. 4, lines 35-48) The query term correlation data is generated from the query log using a table generation process (col. 8, lines 19-21). Bowman further discloses a generation of a correlation table which goes through the most recent daily query log file to identify all multiple-term queries that returned at least one items in the query result. The generation process correlates each query term found in the set of queries to related terms that were used with the key term in a particular query, and assigns the related term a correlation score. The correlation score indicates the frequency with which specific terms have historically appeared together within the same query during the period reflected by the daily query log. The generation process stores the terms coupled with their correlation scores in a daily results files (Col. 9, lines 38-53).

In correlating terms, the generation process takes each extracted query and for each query term adds a single-character field prefix that indicates the search files in which the query term was entered (col. 10, lines 42-35). The generation process then maps each query term found in the query and its prefix to other terms used that

particular query. The correlation score is maintained for each related term in the mapping based on the number of times the related term occurred in combination with the key term. (Col. 10, lines 48-53) The among by which the correlation scores are incremented may be increased or decreased depending on different kinds of selections actions performed by the user on items identified in query results (col. 11, lines 35-38). The generation process generates the query correlation table for a composite period by combining the entries of the daily results files for the length of the composite period (col. 11, lines 61-64). When a user performs a search which identifies more than a predetermined number of items, the related term selection process returns a query result listing items that match the query along with a set of related terms generated from the query correlation table (col. 12, lines 44-51). The selection process enters a loop in which the selection process looks up a query term in the correlation table and then retrieves the term's related terms list. This continues for each term in the query. Next, if the query has multiple terms, the selection process combines the related terms lists. The lists are preferably combined by taking the intersection of the related terms list and summing the correlation scores of the remaining terms. Every term which remains in the list is a term which ahs appeared in at least one prior, successful query, in combination with every term of the present query. The selection process combines the related terms lists by summing the correlation scores of terms common to other related terms lists, without deleting any terms. (Col. 12, line 60 – col. 13, lines 16) The selection process selects the X terms with the highest values from the list, where X can be any desired number. The selection process chooses the top X related terms without

regard to the field prefixes of these related terms. The selection process may alternatively be configured to select only those related terms that correspond to the search field(s) of the present query. (Col. 13, lines 17-26)

Such generating query term correlation data which reflects the frequency with which specific terms have previously occurred together within the same query; generation process which correlates each query term found in the set of queries to related terms that were used with the key term in a particular query, and assigns the related term a correlation score; correlation score which indicates the frequency with which specific terms have historically appeared together within the same query during the period reflected by the daily query log; generation process which takes each extracted query and for each query term adds a single-character field prefix that indicates the search files in which the query term was entered; generation process which then maps each query term found in the query and its prefix to other terms used in that particular query; correlation score which is maintained for each related term in the mapping based on the number of times the related term occurred in combination with the key term; user performing a search which identifies more than a predetermined number of items, wherein the related term selection process returns a query result listing items that match the query along with a set of related terms generated from the query correlation table; selection process enters a loop in which the selection process looks up a query term in the correlation table and then retrieves the term's related terms list; if the query has multiple terms, the selection process combines the related terms lists, wherein the lists are preferably combined by taking the intersection of the related

terms list and summing the correlation scores of the remaining terms; selection process combines the related terms lists by summing the correlation scores of terms common to other related terms lists, without deleting any terms; selection process selects the X terms with the highest values from the list, where X can be any desired number, the selection process can chose the top X related terms without regard to the field prefixes of these related terms and may alternatively be configured to select only those related terms that correspond to the search field(s) of the present query are considered "a correspondence generating unit configured to specify correspondence relations between attributes.., based on an equivalence relation which satisfies a reflexive law, a symmetric law and a transitive law...[and] configured to extract, by a cellular decomposition operation, one or more of the specified correspondence relations...by decomposing a set of attributes into nonempty disjoint equivalence classes according to the equivalence relation".

Appellant remarks that Bowman and Ng, whether taken alone or in combination, do not teach or suggest: "a correspondence presenting unit configured to present the extracted correspondence relations to subsequent customers...such that the common subspace satisfying a necessary condition for concluding prior electronic commercial transactions is attached to cellular spaces corresponding to the subsequent customers.., by a cell attaching operation...". (Arguments section, page 22, second paragraph)

Examiner does not agree. The combination of Bowman and Ng teaches or suggest the recitation above, specifically, Bowman teaches the above recitation.

Bowman discloses a search refinement method for generating and displaying related query terms. The related terms are generated using query term correlation data that is based on historical query submission to the search engine. (Col. 2, lines 30-34) Bowman discloses a search engine that is used to assist customers of Amazon.com Inc. in locating items from an on-line catalog of products (col. 5, lines 9-12). The Amazon.com web site includes functionality for allowing users to search, browse and make purchases from an online catalog of products via the Internet. Because the catalog contains million of items it is important that the site provide an efficient mechanism for assisting user in locating items. (Col. 5, lines 23-29) The web site includes a web server application which processes user request received from user computers. These requests include queries submitted by users to search on-line catalog for products. (Col. 5, lines 30-34) A query server which processes the queries by searching a bibliographic database which includes information about various products that users may purchase through the web site (Col. 5, lines 40-44)

Furthermore, Bowman discloses ways of presenting the related terms to the user (col. 14, lines 2-4). The related terms are presented with the combination of both the original query term(s) and a respective related term (col. 14, lines 10-12). A sample query result page in which a user has performed a subject filed search on the terms "OUTDOOR TRAIL" and has received a set of three related terms each of which is incorporated onto a respective hyperlink. The page will also contain a listing of the query result items. If the user clicks on the hyperlink “OUTDOOR TRIAL-BIKE”, the search engine will perform a search using the terms “S (subject)-OUTDOOR”, “S-

TRAIL" and "S-BIKE", and will then return the associated items. (Col. 14, lines 26-35) The query server automatically selects the related term at the top of related terms list and searches the query result to identify a subset of query results items that include this related term. The query server effectively applies the top suggested modified query to the bibliographic database. The items within the subset can then be displayed to user at the top of the query result list and/or can be displayed in highlighted form. Further, the query server could cache the list of items that fall within the subset so that if the user submits the modified query, the query server could return the result of three modified search. Special tags or codes could be embedded within the modified-query hyperlinks and passed to the web site to enable the query server to match modified queries to the cached results. (Col. 14, lines 37-57)

Such Amazon.com web site includes functionality for allowing users to search, browse and makes purchases from an online catalog of products via the Internet; query server which processes the queries by searching a bibliographic database which includes information about various products that users may purchase through the web site; related terms which are presented with the combination of both the original query term(s) and a respective related term; query server which automatically selects the related term at the top of related terms list and searches the query result to identify a subset of query results items that include this related term; query server which effectively applies the top suggested modified query to the bibliographic database; and items within the subset can then be displayed to user at the top of the query result list and/or can be displayed in highlighted form are considered "a correspondence

presenting unit configured to present the extracted correspondence relations to subsequent customers...such that the common subspace satisfying a necessary condition for concluding prior electronic commercial transactions is attached to cellular spaces corresponding to the subsequent customers.., by a cell attaching operation...".

Appellant remarks "for the reasons listed above for claims 6, as well as for the additional elements included therein, claims 7-14 are also believed to be in condition for allowance". (Arguments section, page 23, third paragraph)

Examiner directs Appellants attention to the discussion above pertaining to claim 6.

II. Rejection under 35 U.S.C. § 103(a) over Bowman et al. and Ng in further view of Bauer et al.

A. Claim 25

Appellant remarks that "none of Bowman et al., Ng or Bauer et al., whether taken alone or in combination, teach or suggest at least the elements of: detecting mutually-contradicting correspondence relations among the correspondence relations in the attribute correspondence, table; defining an apparently false correspondence relation from the mutually-contradicting correspondence relations based on statistical analysis; and deleting the apparently false correspondence relation from the attribute correspondence table", as recited in claim 25. (Argument sections, page 26, second paragraph).

Examiner does not agree. The combination of Bowman, Ng and Bauer teaches or suggest the recitation above, specifically, Bauer teaches the above recitation. Bauer teaches a database synchronizer which facilitates computing system which has client-

side and server side applications that share data in similar organizational structure. (col. 1, lines 58-61). The client determines what modifications to the client data have taken place in the last time of synchronization. The modifications detected are the creation of a new data item, an update to the value of an exiting data item, and the deletion of a data item. The modifications are propagated to the server, which has determined what changes have taken place to the server data since the last time of synchronization. Finally the server detects data conflicts, resolves them, and propagates modification back to the client as refresh data. (Col. 2, lines 7-21) (32) Bauer further teaches conflict which exits in the following situations: 1. The row on the server Rs(k) and the corresponding row on the client Rc(k) have been separately updated to different values, even if the updated columns are disjoint. For example, the same column at the server and the client can both change to different values, thus this result in a direct column conflict that must be settled by selecting one value and discarding the other; and different columns can change at the server and client, thus this result in a conflict that can be resolved without discarding either value; 2. a row R(k) has been updated in one place (client or server) and deleted in the other. In effect, each updated column of the row that still exists is in conflict with the non-existent column of the non-existent row in the other location; and 3. a row R(k) did not exist at the time of the last refresh and row R(k) has since been inserted (and possibly updated) in both places and the server row Rs(k) is not equal to the corresponding client row Rc(k). If a conflict is detected, then the server node 10 performs processing steps to resolve the conflict. When a conflict has been detected, it must be resolved if the tables are to return to a synchronized

state. During conflict resolution, a detected conflict is resolved in favor of the client or server, depending on information stored in a table correspondence, which is preferably defined for each table in the server catalog 70. (Col. 10, line 46-col. 11, line 8)

Such client which determines what modifications to the client data have taken place in the last time of synchronization; modifications detected which are the creation of a new data item, an update to the value of an exiting data item, and the deletion of a data item; server which detects data conflicts, resolves them, and propagates modification back to the client as refresh data; if a conflict is detected, then the server node performs processing steps to resolve the conflict; when a conflict has been detected, it must be resolved if the tables are to return to a synchronized state; and during conflict resolution, a detected conflict is resolved in favor of the client or server, depending on information stored in a table correspondence, which is preferably defined for each table in the server catalog; and the conflict which includes row on the server Rs(k) and the corresponding row on the client Rc(k) have been separately updated to different values, even if the updated columns are disjoint, an example would be the same column at the server and the client can both change to different values, thus this result in a direct column conflict that must be settled by selecting one value and discarding the other; a row R(k) has been updated in one place (client or server) and deleted in the other, thus each updated column of the row that still exists is in conflict with the non-existent column of the non-existent row in the other location; and a row R(k) did not exist at the time of the last refresh and row R(k) has since been inserted (and possibly updated) in both places and the server row Rs(k) is not equal to the

corresponding client row Rc(k) are considered "detecting mutually-contradicting correspondence relations among the correspondence relations in the attribute correspondence, table; defining an apparently false correspondence relation from the mutually-contradicting correspondence relations based on statistical analysis; and deleting the apparently false correspondence relation from the attribute correspondence table".

B. Claims 15, 16 and 17

Appellant remarks pertaining to claims 15, 16 and 17 are similar to that described in relation to claim 25. (Argument sections, page 27, first paragraph).

Examiner directs Appellants attention to the discussion above pertaining to claim 25.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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